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(54) Mono-polar modular terminal block

(57) The mono-polar modular terminal block includes an insulating case (1) which has an overall parallelepipedal shape and, inside this case, a connector block (50) which includes an input terminal (78) and several output terminals arranged in three rows one above the other, with binding screws (80, 81, 82) whose heads are accessible from one side (59) of the connector block (50) located opposite the case's (1) front wall (5).

As the case's (1) front wall (5) has a setback or nosing (11) with an external lug, the side (59) of the connector block (50) from which the binding screws (80, 81, 82) are accessible has a three-step staircase shaped surface (60) each step being associated with one of the rows of terminals, with a first step which is adjacent to the case's (1) rear wall (4) and a last step which at least partly enters the case's (1) front wall's (5) nosing (11).

SCHEMA/DIAGRAM

Description

{0001} This invention concerns a mono-polar modular terminal block for connecting several conductors to one sole electrical potential supplied by a power supply cable.

{0002} In an electrical distribution panel board, on the head apparatus' downstream, an apparatus called a terminal block is often used to divide a unique input power supply into several outputs of reduced intensity. In particular, they could be modular terminal blocks which, with other electrical apparatus which is also described as modular, are arranged side by side on the same support rail and whose width is a multiple of a basic module which is shared by all of this electrical apparatus.

{0003} For low intensity electrical wiring, the terminal blocks are usually multi-polar in so far as they distribute several poles with different electrical potentials. For example, these types of terminal block are bi-polar which include two parallel connecting strips which each form on their own a row of terminals for conductors with for example one phase strip and one neutral strip or even tri-polar or tetra-polar strips which include three or four parallel connecting strips with two or three phase strips and a neutral strip.

{0004} However, when the input power supply's intensity is greater, it is preferable to use larger connecting strips which, for insulating and intervention safety reasons should be housed in individual, insulating cases each dedicated to a determined pole. These terminal blocks are described as mono-polar.

{0005} In this way, we are familiar with mono-polar modular terminal blocks for connecting several conductors to one same electrical potential which includes :

- An insulating case which is overall parallelepipedal in shape which has on four of its sides positioned two opposite the other two, two side plates, a rear wall equipped with means for assembly on a support rail and a front wall and, on its other two opposite sides, an input opening for connection with the electrical potential and an output opening for the conductors.
- And, inside the aforementioned case, a conductor terminal block which includes an input terminal for its connection to the electrical potential and several output terminals for connection with this block's different conductors. These are created by reception drilling the aforementioned conductors which are arranged according to a common directive in three rows one above the other and a quadrature-axis binding screw comes out of each of these conductors. This is because each time it is drilled, the end of the conductors which is introduced first which comes out of the first side of the terminal block located opposite the case's output opening, and as the different binding screws are arranged according to a common directive perpendicular to the common directive for conductor reception drilling, in three rows one above the other which correspond to the three conductor reception drilling rows, with their heads accessible from the second side of the terminal block located opposite the case's front wall.

{0006} However, this type of mono-polar terminal block which is currently on the market has a major defect : it is not possible for the operator to check whether the end of each conductor is sufficiently engaged in the drilled part of the terminal block into which it has been inserted so as to exceed the corresponding binding screw's perpendicularity in order for it to be held sufficiently tightly by the end which comes out of this screw against the housing internal surface.

{0007} Moreover, as for any modular apparatus, strict size constraints are imposed on such a mono-polar modular terminal block. In particular, the depth of the terminal block's case, i.e. the distance between its front and rear walls, is limited in relation to its height which in the same way limits the overall dimensions which can be tolerated for the terminal block.

{0008} In these conditions, the aim of the invention is to offer the aforementioned type of mono-polar modular terminal block which allows the operator to check that the conductors are correctly engaged in the reception drilled part of the terminal block and which respects the box's size limitations, in particular as far as depth is concerned, which are imposed by the standards.

{0009} To achieve this aim, the aforementioned type of mono-polar modular terminal block is anticipated. Its case's front wall has a setback or nosing with an external lug, the terminal block's second side from which the binding screws are accessible has a three-step staircase shaped surface each step being associated with one of the reception drilled parts' rows and the corresponding binding screw row, with a first step which is adjacent to the case's rear wall and which is equipped with the input terminal and a last step which is at least partly enters the case's front wall's nosing, on the second side of the terminal block, each of the three steps of three-step staircase shaped surface has a counter-step side where a second end of an associated row of the reception drilled parts' comes out. The conductors come out here and an operation side on which the corresponding binding screw row's heads are accessible.

{0010} Because of this arrangement of the terminal block's second side in the shape of a staircase, the conductors which are introduced from the terminal block's first side by the corresponding reception drilled parts' first end come out of these drilled parts via their second end on the terminal block's second side. In this way, the conductors' ends may jut out beyond the counter-step sides of the staircase-shaped surface on the second side of the terminal block to enable the operator to see directly whether each conductor is suitably inserted into the drilled part clearing the corresponding binding screw.

{0011} Moreover, the fact that the second end of the conductors' reception drilled parts comes out entirely on the corresponding counter-step side of the terminal block's second side's staircase-shaped surface imposes a relatively significant depth for each of these three counter-step sides. Bearing in mind the diameter constraints of the conductor cables' reception drilled parts and the thickness of the material, the result is a terminal block whose total depth is greater than that of the space available inside the case. This theoretical conflict is overcome in practice in a terminal block whose case's front wall would usually have nosing with an external lug by using the additional inside space made deep down by this nosing to accommodate the top part of the terminal block which corresponds to at least part of the last step of this block's second side's staircase-shaped surface. In this way, a terminal block whose case respects the size constraints imposed by the standards is obtained and therefore the terminal block allows the operator to check with ease that the conductors are correctly engaged in the reception drilled part of the terminal block.

{0012} In accordance with one of the invention's advantageous features, at least one of the terminal block's second side's staircase-shaped surface counter-step sides is pared down in comparison with this second side. This pared-down arrangement of one or several of the terminal block's second side's staircase-shaped surface counter-step sides makes it easier to see the end of each conductor which juts out from the drilled part into which it is engaged to ensure that it does not jut out too far.

{0013} In accordance with another of the invention's advantageous features, the terminal block's first side, from which the conductors' reception drilled parts' first end comes out also has a surface in the shape of a three-step staircase which has three step sides opposite the terminal block's second side's staircase-shaped surface's counter-step sides and the first end of a corresponding row of conductor reception drilled parts comes out onto each of them. In this way, the terminal block's total material volume is minimised which in turn also reduces the cost and the weight. Furthermore, it becomes easier to push each conductor into a stripped end of standard length.

{0014} Thus, it is a great advantage that the staircase-shaped surface's last step's side on the first side of the terminal block is pared down in relation to this block's second side. This makes it easier to introduce the conductors into the reception drilled parts via this last step's side.

{0015} Other features and advantages of the invention will appear when reading the following description of a particular contract method which is given as an unrestrictive example.

{0016} Reference will be made to the drawings in the appendices amongst which :

- Figure 1 is a perspective view, from the outside of a terminal block in accordance with the invention ;
- Figure 2 is a perspective view of the terminal block in Figure 1, which shows the inside of this terminal block whose front wall and one of its side plates have been opened ;
- Figure 3 is an isolated view in perspective of the terminal block equipped with its output terminals' binding screws and two stirrup bolts or screw-bearing cages which form the input terminal and an additional output terminal ;
- Figure 4 is a view in perspective of the stripped terminal block without binding screws or stirrup bolts or screw-bearing cages ;
- Figure 5 is a cross-section by Figure 4's plan V ;
- Figures 6 and 7 are views in perspective of the internal and external sides respectively of the flat panel which is used to create the terminal block's case.

{0017} With reference to the figures, and in particular Figure 1, a mono-polar modular terminal block conforms to the invention for the connection of several conductors (not shown) to one same electrical potential supplied by a power supply cable (not shown) and includes a case 1 made of an insulating plastic material which has an overall parallelepipedal shape. This case includes on four of its sides two opposite the other two, two side plates 2,3, a rear wall 4 and a front wall 5. The case 1 has two other opposite sides, that is, with reference to Figure 1 where the front and rear walls 5 and 4 and two side plates 2 and 3 are vertical, an upper side on which the case 1 includes an upper wall 6 in which an upper input opening 7 has been made for the power supply cable and a lower side on which the case 1 has a wide lower output opening 8 for the conductors. The lower output opening 8 is simply delimited by the lower edges of the two side plates 2 and 3 and the front and rear walls 5 and 4.

{0018} The case's rear wall 4 is equipped with fastenings 10 on the outside for its sliding assembly on a distribution panel board's (not shown) support rail (not shown). The case's 1 front wall 5 has an indentation or nosing 11 with an external lug. This nosing is meant to bear an inscription, a light or a control instrument and to cross the distribution panel board's mask or insulating panel (not shown) to be visible and accessible from the outside of this panel.

{0019} Case 1 is created using a bell-shaped panel which is moulded flat as shown in Figures 6 and 7, then it is assembled as shown in Figures 1 and 2. This panel which is made of moulded plastic is shown in Figures 6 and 7 and includes a central rectangular panel 6 which after assembly constitutes the case's 1 upper wall 6 in which the upper input opening 7 is made. This central panel 6 has four sides to which four side panels are linked.

{0020} Thus, a first side panel 2 and a second side panel 3 can be made out which are symmetrical to each other in relation to a panel and case median symmetry plan which is obtained after setting and which are linked respectively to opposite first and second sides of the central panel 6 by bridging connecting zones 12, 13. These bridging connecting zones 12, 13 allow the first and second side panels 2 and 3 to be raised considerably at right angles to assemble the case so that these first and second side panels 2 and 3 form the two side plates 2, 3 as shown in Figures 1 and 2.

{0021} As shown in Figures 2 and 6, the first and second side panels 2 and 3 each have a right-angled interior return 4.1, 4.2 on their rear edge which extends considerably in a plan which takes in a fourth side of the central panel 6 opposite the third side. These returns 4.1, 4.2 each constitute half of the case's 1 rear wall 4 and are arranged thus so that after assembly they are edge to edge. These free edges 17, 18 are equipped with locking mechanisms which maintain the first and second panels 2, 3 in their assembly set-up which form the case's 1 side plates 2, 3 and the rear wall 4.

{0022} These locking mechanisms which equip the returns 4.1, 4.2 include in this instance indexing mechanism methods 19, 20 as well as complementary mortice and tenon joint type interlocking mechanisms 21, 22. In this way both automatic locking using indexing mechanism methods by simply connecting the first and second side panels' 2, 3 returns 4.1, 4.2 edge to edge and a rigid maintenance in shearing and bending of the rear wall 4 formed by the two returns 4.1, 4.2 in their free edges' 17, 18 edge to edge interface zone are obtained.

{0023} Each of the first and second side panels' 2, 3 returns 4.1, 4.2 is equipped externally with a corresponding part of the case's 1 rear wall 4 fastenings 10 which are used for the sliding assembly of this case on a distribution panel board's (not shown) support rail.

{0024} In addition, the first and second side panels 2, 3 each have a tab with a internal lug 23, 24 which extends in parallel and at a distance from the aforementioned panel's return 4.1, 4.2. After assembly, these tabs with lugs 23, 24 are edge to edge so as to form a reinforcing spacer which comes between the case's 1 two side plates 2, 3 formed by the aforementioned panels. The spacer which is thus formed by the tabs with lugs 23, 24 further reinforce the case's 1 rigidity after assembly and in particular its resistance to any side compression force which may be exerted on the plates 2, 3 during transport, handling or case 1 assembly. To be more precise, the tabs with lugs 23, 24 have free edges 25, 26 which after assembly are edge to edge and connected using complementary mortice and tenon joint type interlocking mechanisms 27, 28. These interlocking mechanisms further reinforce the spacer's resistance to bending and shearing : the spacer is formed by the tabs with lugs 23, 24 in the interface zone between their edge to edge free edges 25, 26.

{0025} Each of the side plates 2, 3 has a front edge 40, 41 opposite its return which is arranged according to the front wall's 5 corresponding side edge and which has a slot 42, 43 which closely follows the front wall's 5 nosing's 11 corresponding side edge.

{0026} A third side panel 5 can be made out which is connected to a third side of the central panel 6 by a bridging connecting zone 14 which allows this third side panel to be raised considerably at right angles for case assembly so that this third side panel forms the case's 1 front wall in accordance with the illustration in Figure 1.

{0027} This third side panel 5 is equipped with locking mechanisms which here take the form of keys with side lugs 30, 31 made on the side panel's 5 side edges at the nosing's 11 lower base which after the first and second side panels 2, 3 have been assembled to form the case's 1 side plates and the rear wall 4 work with the side plates' 2, 3 corresponding methods which here are made up of notches 32, 33 made in these side plates' corresponding front edges 40, 41 at the slots' 42, 43 lower base. The keys' 30, 31 engagement in the notches 32, 33 in this way ensures that the third side panel 5 is held in its assembly set-up in which it forms the case's 1 front wall as shown in Figure 1.

{0028} To facilitate and ensure the reliability of folding the third side panel 5 against the side plates 2, 3 and its locking in the closed position in which it forms the case's front wall 5, the side plates' 2,3 front edge's 40, 41 slots 42, 43 are at a blunt, inferior angle 44, for example rounded up or down as in this instance or even bevelled which form an incline for the keys 30, 31 to cross a fixed point which forces the elastic bending of the nosing 11.

{0029} However the front wall's 5 keys 30, 31 can be disengaged from the notches 32, 33 by simply distorting the front wall 5 by elastically bending it. The keys' 30, 31 hold on the notches 32, 33 can be disengaged independently of the first and second side panels' 2, 3 returns' 4.1, 4.2 locking mechanisms 19, 20, 21, 22. In this way it is possible to open the case's 1 front wall by pivoting around its bridging connecting zone 14 at the central panel 6 like a cover using a screw-driver in the front wall's 5 slot F whilst keeping the first and second side panels in the assembly set-up position which forms the side plates 2, 3 and the rear wall 4.

{0030} In this way, after the case's basic structure made up of the central panel 6 and the first and second side panels 2, 3 has been assembled to form two side plates 2, 3 and the rear wall 4, the third side panel 5 is simply folded back against the two side plates' 2, 3 corresponding front edges. The front wall's 5 keys 30, 31 then engage with the notches 32, 33 made in the side plates' 2, 3 corresponding front edges to keep this front wall 5 closed. The case 1 is then closed except for the openings 7, 8 which contain the conductors which are connected to the equipment that it contains, this will be explained in more detail later.

{0031} After this complete case 1 assembly operation, the front wall 5 can be raised like a cover by disengaging the keys' 30, 31 hold on the notches 32, 33 to give wide, open access to the inside of the case 1, and consequently to the equipment that it contains.

{0032} The panel which is used to make the case 1 includes as shown in Figures 2, 6 and 7, a fourth side panel 35 which is connected to the central panel's fourth side 6 by a bridging connecting zone 36 which allows it to be raised at a right angle for case 1 assembly and which, after assembly, forms a lining wall for the rear wall 4. This case's 1 rear wall 4 lining reinforces the insulation of the electrical equipment that it contains as far as everything at the rear of the case 1 is concerned and in particular as far as the electrical distribution panel board's support rail (not shown) to which the case 1 is added, which is generally made of a conductive metallic material. Indeed, it is understood that after the case's 1 assembly, the lining wall 35 forms a sort of chicane which extends the route of the creepage distance which comes from the equipment housed in the case 1 and which runs the risk of crossing the rear

wall 4, between the returns' 4.1, 4.2 free edges 17, 18 which form the rear wall 4 and between which a certain empty space inevitably remains for any tracking current to pass. Of course, this reinforcement of the electrical equipment's insulation is particularly useful when the case 1 contains equipment which is subject to intensities and/or high voltage as is particularly the case for a one-phase terminal block case.

{0033} In the example shown, the case 1 is intended to receive a terminal block which, as will be explained in more detail later, is subjected to a high intensity and/or voltage mainly in the upper part, next to the upper input opening 7 via which the equipment is connected to the source electrical potential. That is why here it is anticipated that the lining wall 35 which is formed by the fourth side panel only extends to about half the height of the rear wall 4 formed by the first and second side panels' 2, 3 returns 4.1, 4.2.

{0034} Moreover, after assembly, the lining wall 35 formed by the fourth side panel is situated inside the rear wall 4 formed by the first and second side panels' 2, 3 returns 4.1, 4.2. Each of these first and second side panels' 2, 3 returns 4.1, 4.2 is equipped with a wedging notch 37, 38 which after assembly is connected with the free end of the fourth side panel which forms the lining wall 35.

{0035} The panel shown in Figures 6 and 7 is thus directly obtained by casting with all of the case's 1 main constituent elements, that is the two side plates 2, 3, the front wall 5 and the rear wall 4 which is formed by the side plates' 2, 3, returns 4.1, 4.2. The case 1 is then obtained by means of a simple assembly operation by pivoting the four side panels 2, 3, 5, 35 on their respective bridging connecting zones. To be more precise, after the fourth side panel 35 has been raised more or less at a right angle, the first and second side panels 2, 3 are raised in turn, so that their returns 4.1, 4.2 close up against each other, edge to edge, behind the fourth side panel 35, this fourth panel's free end comes to rest in the returns' 4.1, 4.2 associated wedging notches 37, 38. The locking mechanisms 19, 20, 21, 22 which equip the returns 4.1, 4.2 are engaged to ensure that the case's 1 lining wall's 35 and rear wall's 4 two side plates 2, 3 remain assembled. The only operation left to perform is to fold the third side panel 5 back between the side plates' 2, 3 corresponding front edges by engaging the keys 30, 31 in the notches 32, 33 so that the third side panel forms the case's 1 front wall, and thus completes the creation of this case.

{0036} It should be noted that the fact that the case's 1 rear wall 4 is made of two returns 4.1, 4.2 all in one block with the side panels 2, 3 which form the case's 1 side plates considerably strengthens not only the case itself 1 but also its link with the aforementioned distribution panel board's (not shown) support rail created using fastenings 10 which equip the returns 4.1, 4.2. As a result, the simplicity and low cost of a case 1 made in this way does not compromise the high quality of mechanical performance which is essential to this case.

{0037} As shown in Figure 2, a conductor connector block 50 for example made of brass goes inside the case 1. This connector block 50 has a first side 51 which is located opposite the case's 1 lower output opening 8 and which for this reason will henceforth be called the lower side. This lower side 51 of the connector block 50 has an interior three-step staircase shaped surface which has three step sides 53, 54, 55 which are oriented opposite the case's 1 lower opening and three counter-step sides 56, 57, 58 which are oriented opposite the case's 1 rear wall 4. The connector block's 50 lower side's 51 staircase shaped surface 52 thus has three steps, with a first step formed by the counter-step side 56 and the step side 53, a second step formed by the counter-step side 57 and the step side 54 and a third and final step formed by the counter-step side 58 and the step side 55.

{0038} The connector block 50 has a second side 59 which is located opposite the case's 1 front wall 5 and which for this reason will henceforth be called the front side. This case's 1 front side 59 has a three-step staircase shaped surface 60 which has three step sides 61, 62, 63 which are oriented opposite the case's 1 front wall 5 and three counter-step sides 64, 65, 66 which are oriented opposite the case's 1 upper input opening 7.

{0039} The connector block's 50 front side's 59 staircase shaped surface 60 thus has three steps, with a first step formed by the counter-step side 64 and the step side 61, a second step formed by the counter-step side 65 and the step side 62 and a third and final step formed by the counter-step side 66 and the step side 63. The staircase shaped surface's 60 last step's side 63 and the staircase shaped surface's 52 last step's side 55 are adjacent and are connected by a common edge.

{0040} Both the connector block's 50 lower 52 and front 60 staircase shaped surfaces have been more or less arranged in connection with each other so that the connector block 50 has two sides opposite another two sides. In this way, the connector block's 50 lower side's 51 staircase shaped surface's 52 step sides 53, 54, 55 are respectively opposite this block's front side's 59 staircase shaped surface's 60 counter-step sides 64, 65, 66. In the same way, the block's 50 lower side's 51 staircase shaped surface's 52 counter-step sides 56, 57, 58 are respectively opposite this block's front side's 59 staircase shaped surface's 60 step sides 61, 62, 63.

{0041} A row of pierced drilled parts 67, 68, 69 designed to accommodate the stripped ends of the aforementioned conductors is associated with each of the case's 1 front side's 59 staircase shaped surface's 60 corresponding counter-step sides 64, 65, 66 and this case's 1 lower side's 51 staircase shaped surface's 52 and the corresponding step sides 53, 54, 55. In this way, output (or outgoing) terminals are formed for connecting conductors. Each of these reception drilled parts 67, 68, 69 has a first end 70, 71, 72 which comes out on the step side 53, 54, 55 with which the corresponding row is associated to which the concerned drilled part belongs and a second end 73, 74, 75 which comes out on the opposite counter-step side 64, 65, 66 which is associated with the same row. With this connector block's 50 front side's 59 staircase surface layout 60, the conductors which are introduced from the connector block's 50 lower side 51 by the corresponding reception drilled parts' 67, 68, 69 first end 70, 71, 72 come out of these drilled parts by the connector block's 50 front side's 59 second end 73, 74, 75. As a result, the conductors' end may exceed the connector block's 50 front side's 59 staircase shaped surface's 60 counter-steps' sides 64, 65, 66 to enable the operator to see directly whether the reception drilled part 67, 68, 69 is correctly engaged in each conductor.

{0042} In the example shown, each of the connector block's 50 front side's 59 staircase shaped surface's 60 counter-step sides 64, 65, 66 is tapered in comparison with this second side. In other words, each of these counter-step sides globally extends diagonally in relation to the reception drilled parts' 67, 68, 69 axes which come out on the concerned counter-step side, so that they are visible on the bias to someone on the front side 59 of the connector block 50 who is looking perpendicularly at the aforementioned drilled parts. This tapered layout of the connector block's 50 front side's 59 staircase shaped surface's 60 counter-step sides 64, 65, 66 allows the each conductor's end excess coming out of the drilled part 67, 68, 69 which accommodates it to be seen more easily, without this excess being too great, which facilitates even further checking that the conductors are correctly engaged in the connector block's 50 reception drilled parts 67, 68, 69.

{0043} In the same way, the connector block's 50 lower side 51 staircase shaped surface 52 last step's side 55 is also counter-tapered in relation to this block's front side 59. In other words, this side of the last step globally extends diagonally in relation to the reception drilled parts' 69 axes which come out on this last step's side, so that they are visible on the bias to someone on the connector block's 50 front side 59 who is looking perpendicularly at the reception drilled parts' axes which are associated with the staircase shaped surface's 52 and 60 last step sides. This tapered layout facilitates the conductors' introduction into the reception drilled parts 69 via the block's lower side's 50 staircase shaped surface's 52 last step's side 55.

{0044} A row of quadrature axis binding screws 80, 81, 82 which are accessible on the step side 61, 62, 63 adjacent to the counter-step side 64, 65, 66 on which the row of concerned reception drilled parts comes out 67, 68, 69 is associated with each of these three rows of reception drilled parts 67, 68, 69. To be more precise, these quadrature axis binding screws 80, 81, 82 are engaged in three rows of cut drilled parts 83, 84, 85 made respectively in the connector block's 50 front side's 59 staircase shaped surface's 60 step sides 61, 62, 63 along the perpendicular axis to the reception drilled parts' 67, 68, 69 axes with which they have been associated to open onto these reception drilled parts. The quadrature axis binding screws 80, 81, 82 are engaged in the cut drilled parts 83, 84, 85 so that their end opens onto the inside of the associated reception drilled parts 67, 68, 69 to ensure the connection and immobilisation of the stripped end of a conductor engaged in the reception drilled part concerned. It should be noted in relation to this, that the fact that it is possible to see the connector block's 50 front side 59 directly that each conductor's end juts out slightly of the reception drilled parts 67, 68, 69 into which it is inserted by this front side's 59 staircase shaped surface's 52 counter-step sides 64, 65, 66 enables the operator to ensure that the stripped end of the aforementioned conductor has actually crossed the corresponding quadrature axis binding screw 80, 81, 82 and that this binding screw can therefore be screwed inside the reception drilled part concerned 67, 68, 69 to immobilise and connect the conductor.

{0045} Two connection brackets 76, 77 extend projected from the connector block's 50, front side's 59 staircase shaped surface's 60 first counter-step's side's 64 to the case's 1 upper wall 6 below the reception drilled parts 67 and in the extension of the connector block's 50, lower side's 51 staircase shaped surface's 52 first counter-step's side's 56.

{0046} Two stirrup bolts or screw-bearing cages 78, 79 are fixed respectively on the brackets 76, 77 to connect these stirrup bolts or screw-bearing cages electrically to the connector block 50. The biggest stirrup bolt or screw-bearing cage 78 forms an input terminal which allows the aforementioned power supply cable (not shown) to be connected to the connector block 50. The smallest stirrup bolt or screw-bearing cage 78 forms an additional output (or outgoing) terminal which allows the connection of a conductor which would otherwise be too wide to be inserted into one of the output terminals formed by the connector block's 50 reception drilled parts 67, 68, 69.

{0047} The invention is not limited to the performance method described above but includes all variations, with equivalent means, which resume its essential features.

Claims

1. Mono-polar modular terminal block for connecting several conductors to the same electrical potential including :

- An insulating case (1) which has an overall parallelepipedal shape with two side plates (2,3) on four of its sides two opposite the other two, one rear wall (4) equipped with assembly means (10) on a support rail and a front wall (5), and on its two other opposite sides an input opening (7) for connection to the electrical potential and an output opening (8) for the conductors,
- And inside the aforementioned case a conductor connector block (50) which includes for connection to the electrical potential, an input terminal (78) and for connection to this block's different conductors, several output terminals which are made up of the aforementioned conductors' reception drilled parts (67, 68, 69) made according to a common directive, on three rows one above the other and a quadrature axis binding screw (80, 81, 82) comes out of each one of them, as each drilled part has a first end (70, 71, 72) for inserting the conductors which comes out of a first side (51) of the connector block (50) located opposite the case's (1) output opening (8), and as the different binding screws (80, 81, 82) are arranged, according to a common directive perpendicular to the conductors' reception drilled parts' common direction, on three rows one above the other which correspond to the conductors' reception drilled parts' three rows, with their heads accessible from a second side (59) of the connector block (50) located opposite the case's (1) front wall (5),

characterised as the case's (1) front wall (5) has a setback or nosing (11) with an external lug, the connector block's (50) second side (59), from which the binding screws' (80, 81, 82) heads are accessible has a surface (60) in the shape of a three-step staircase each step being associated with one of the reception drilled parts' (67, 68, 69) rows and the corresponding row of binding screws (80, 81, 82), with a first step (61, 64) which is adjacent to the case's (1) rear wall (4) and which is equipped with the input terminal (78) and a last step (63, 66) which is inserted at least partially in the case's (1) front wall's (5) nosing (11), in the connector block's (50) second side (59), each of the three steps of the staircase shaped surface (60) has a counter-step side (64,65, 66) where an associated row's reception drilled parts' (67, 68, 69) second end (73, 74, 75) comes out where the conductors come out, and a step side (61, 62, 63) where the corresponding row of binding screws' (80, 81, 82) heads are accessible.

2. Terminal block according to claim 1, characterised as at least one of the connector block's (50) second side's (59) staircase shaped surface's (60) counter-step sides (64, 65, 66) is pared down compared to this second side.
3. Terminal block according to one of the previous claims characterised as the first side (51) of the connector block (50) where the conductors' reception drilled parts' first end (70, 71, 72) comes out also has a staircase shaped surface (52) with three steps which have three step sides (53, 54, 55) opposite the connector block's (50) second side's (59) staircase shaped surface's (60) counter-step sides (64, 65, 66) and at each of them the corresponding row's conductors' reception drilled parts' (67, 68, 69) first end (70, 71, 72) comes out.
4. Terminal block according to claim 3, characterised as the connector block's (50) staircase shaped surface's (52) first side's (51) last step's (55) side is undercut compared to this block's second side (59).

Pages 9, 10, 11 – DIAGRAMS/SCHEMAS

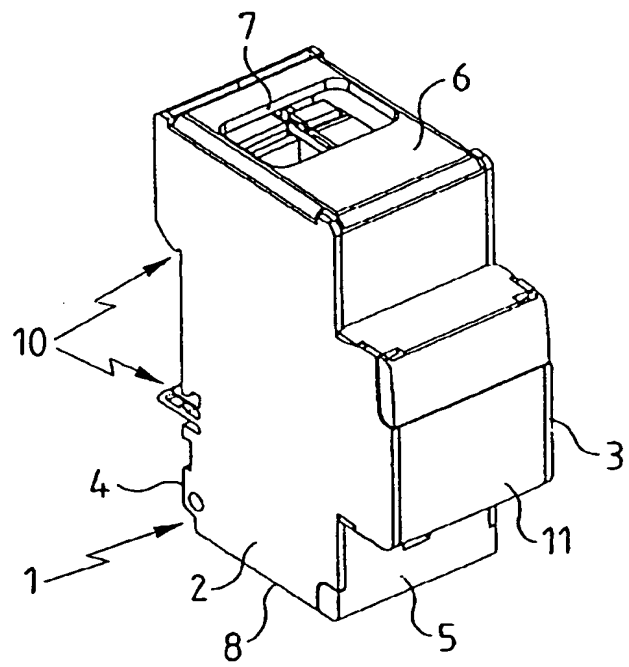


Fig. 1

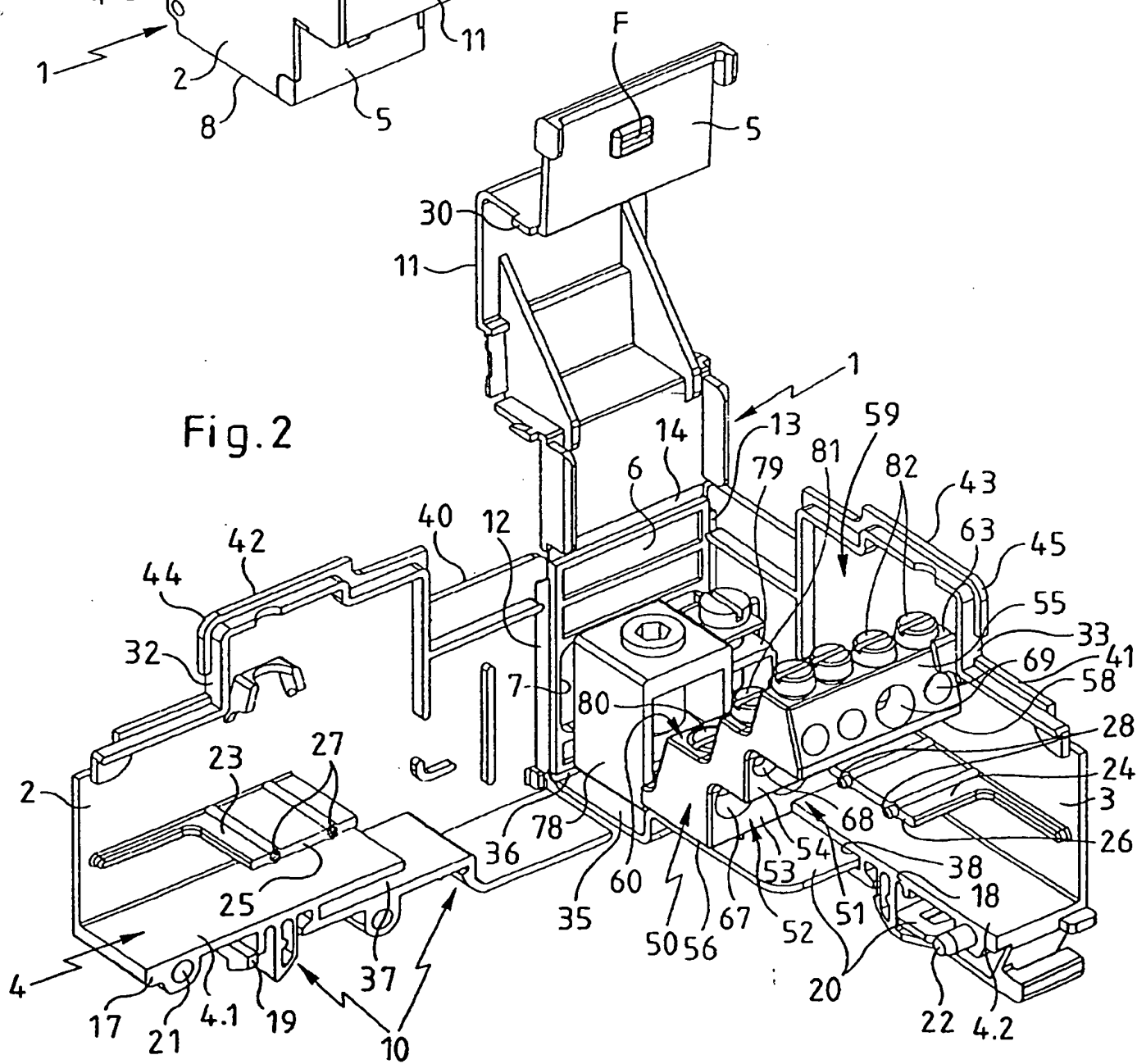


Fig. 2

Fig.3

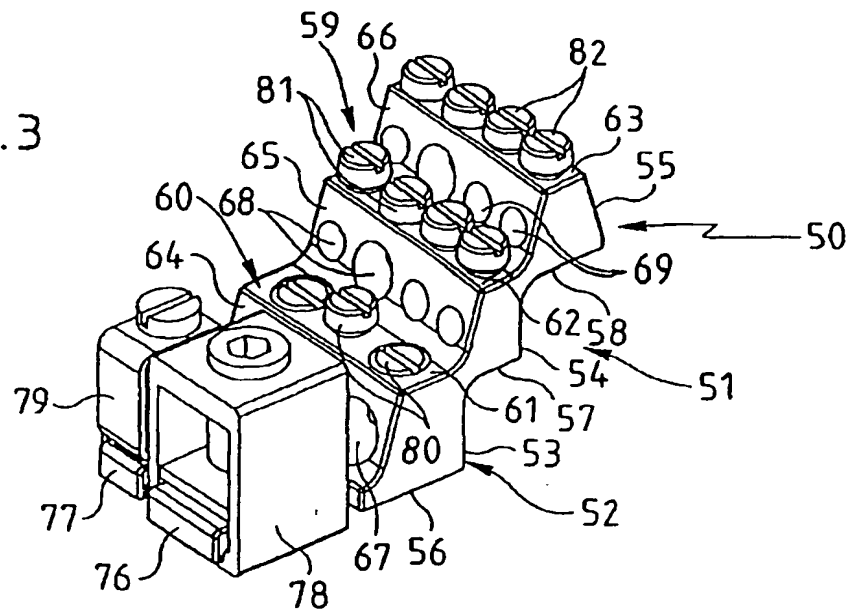
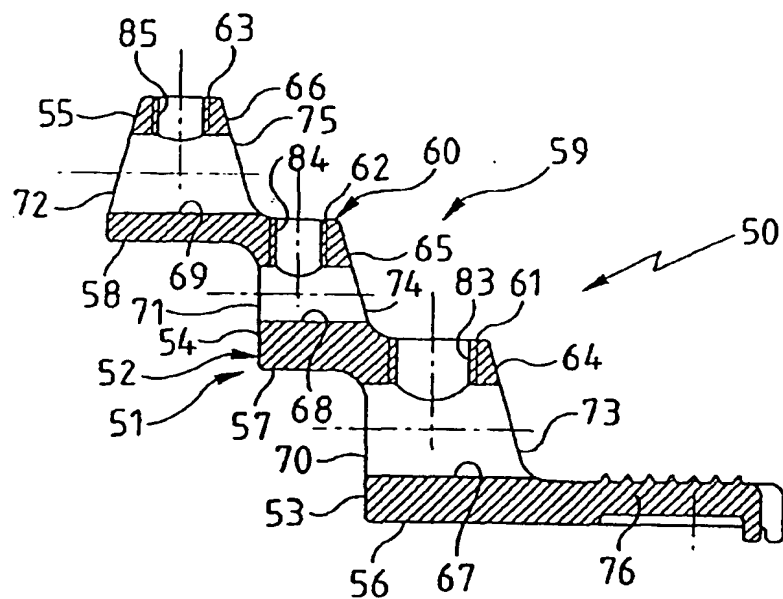
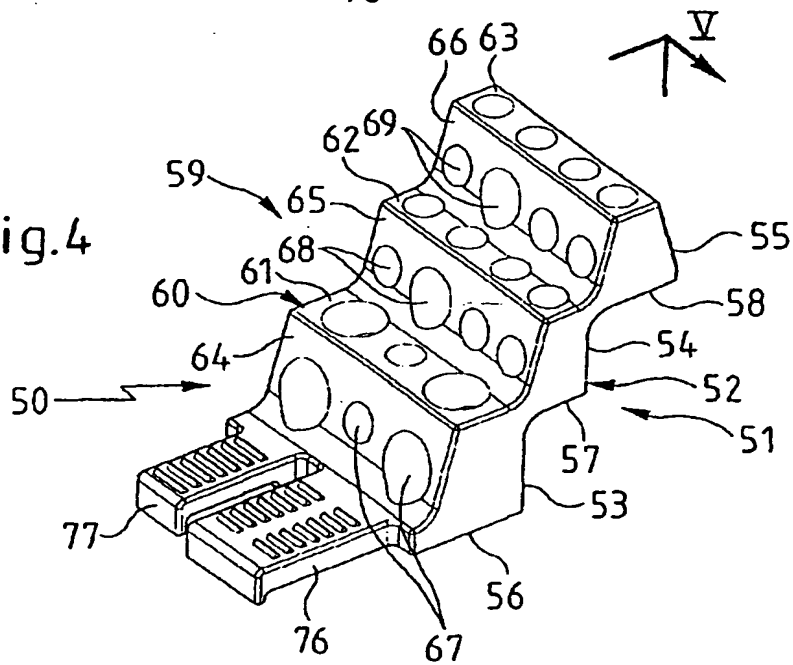


Fig.4



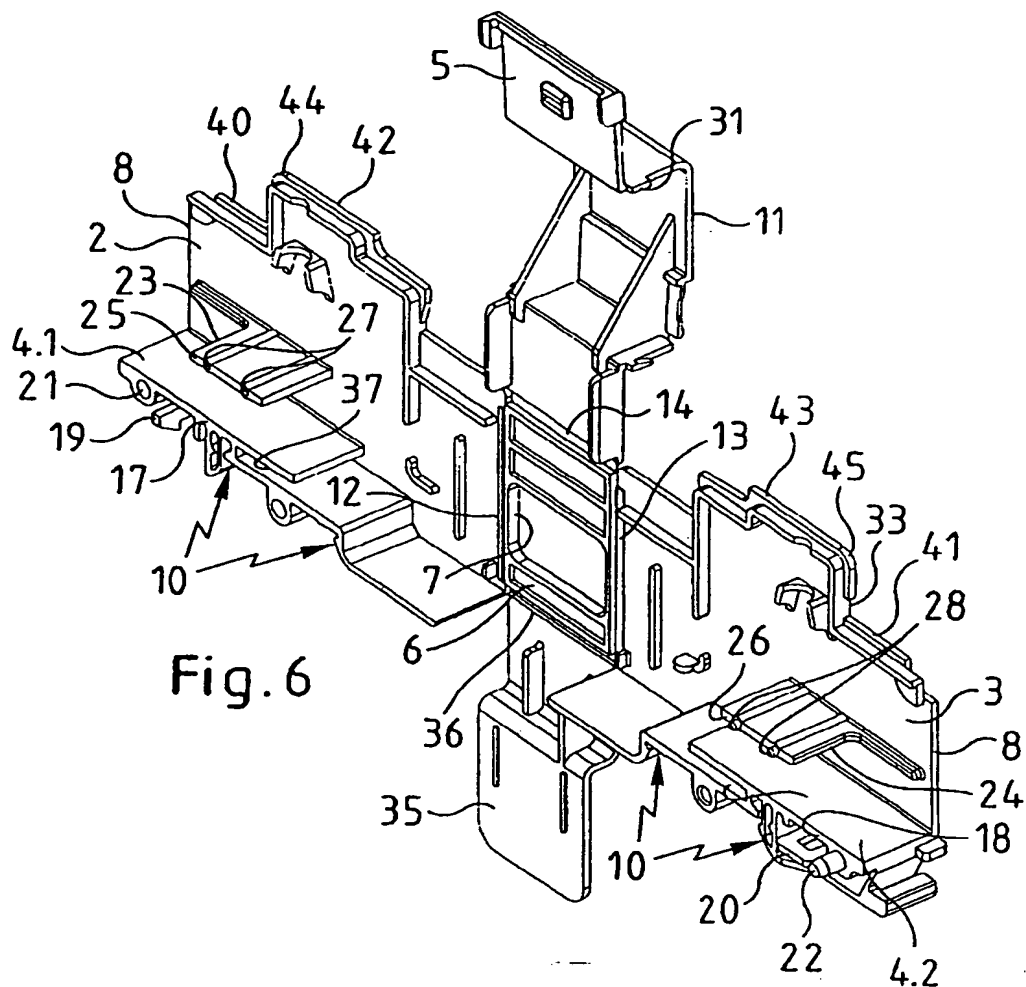


Fig. 6

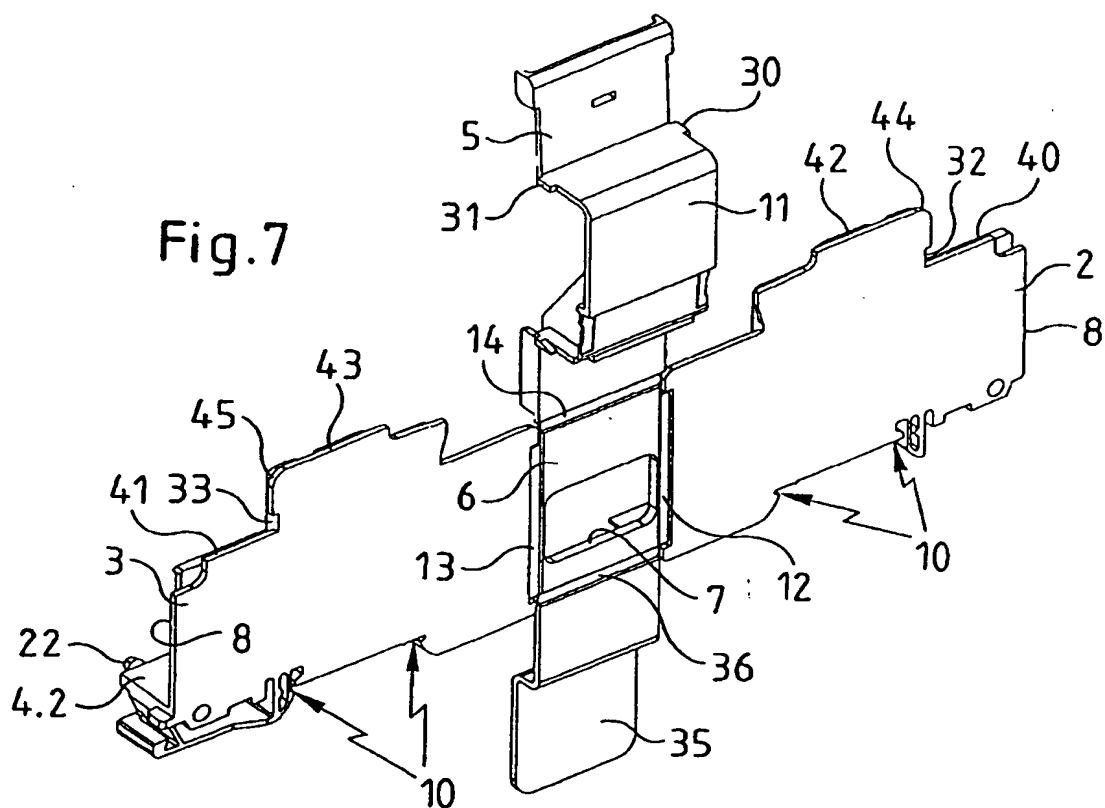


Fig.7